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PRICE LIST

OF

WATER METERS, VALVES,

PRESSURE REGULATORS,

STEAM GONGS,

AND

PLUMBING MATERIALS,

MANUFACTURED BY THE

UNION WATER METER COMPANY,

HERMON STREET,

WORCESTER, MASS.

PHINEAS BALL,

*President.*

A. FITTS,

*Sup't.*

J. C. OTIS,

*Treas.*

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WORCESTER:

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PALLADIUM OFFICE.

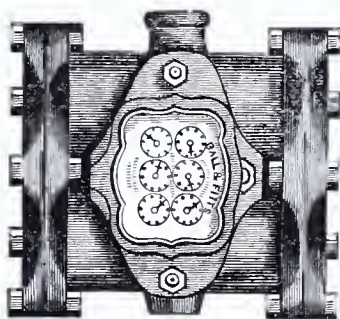
1870.

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# BALL & FITTS'

## HORIZONTAL PISTON WATER METER.



The attention of Water Companies and those using or desiring Water Meters for any purpose, is called to this Meter. It has been perfected after three years' experimenting and use, and is now so far proved as to merit the confidence of the public.

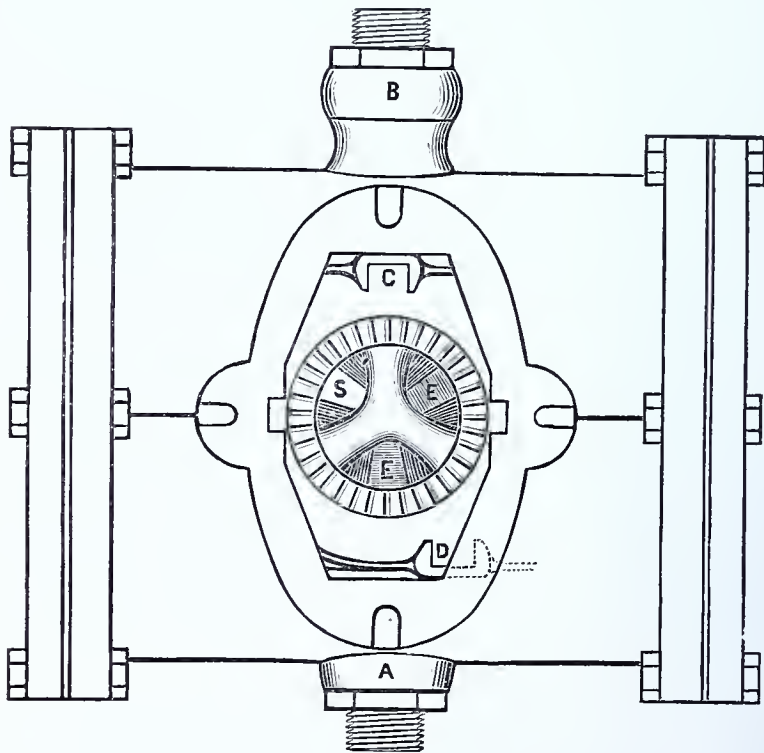
It is a double-acting Piston Meter. The Pistons and Cylinders are so constructed that there are no ports in either. The bodies are made of cast iron, having the cylinders of brass, or entirely of brass, according to the wish of those using; preference being given by the Company to brass, as the material freest from all objections. Where cast iron is used, the entire interior is coated with a composition which, measurably, protects it from oxidation. In all Meters the working parts are made of composition.

There is but one valve, which is in the conical form, and so constructed as to contain the entire number of ports necessary for the operation of the meter. The ports being so disposed in the valve as to fill and discharge opposite ends of the measuring cylinders in such constant succession as to ensure, by the pressure of the water, its uninterrupted motion. The angle at which the valve is fitted to the seat insures its wearing tightly to its bearing surface. Its constant rotary motion is more favorable to its wearing evenly, than the reciprocating. Valves made in this form have been in use for steam and water regulators for more than ten years, for which service they have been found to answer a good purpose, and to wear evenly upon the seat.

Over the top of this valve and geared into it is placed a crank shaft which is rotated by the reciprocating motion of the pistons. The Register is geared directly from the crank shaft without the intervention of any of the ordinary delicate ratchet work usually required to convert the reciprocating into rotary motion. This is a more

substantial and durable arrangement than the common ratchet work. The aim of the inventors has been to combine simplicity of construction, with strength of materials, in such manner as to guarantee durability in the use of years, and to simplify any needed repairs; and have avoided the introduction of all small pins, rivets, or parts, as far as practicable.

In setting the Meter, place it upon its bed with the register directly up, (as shown in the cut,) connecting the inlet pipe with the nipple marked "inlet," by letters upon the casting, and the outlet to the opposite one. The water is admitted over the top of the valve, and in filling and leaving is passed twice through it. The full pressure of the main upon the top of the valve is obviated, as there are always two ports filling and two ports discharging at the same time, making a constant opening equal to one full port on each side of it all of the time. This arrangement very nearly balances the valve so that its pressure upon its seat is not much over that of its own weight. A valve taken from a Meter which had been run one year, was found not to have worn away enough to erase a small mark made with the point of a knife upon the ground surface of it when it was new.



*Fig. 1.*

To put the meter together and set the valve when it has been taken



as the pointers stand, 11.387 cubic feet, omitting the  $\frac{12}{100}$  of a cubic foot represented on the first circle. The larger Meters read in the same manner, only the first circle commences at 10 cubic feet instead of 1. With a little practice and care the Register can be readily and accurately read.

To ascertain the amount of water delivered by them per minute, careful repeated experiments have been made by running the water into a tank and weighing the quantity passed in a given time. The table given below is the average result of from three to ten trials at each pressure.

SIZE OF METER.	10 lbs. pressure to the in.	20 lbs. pressure to the in.	30 lbs. pressure to the in.	40 lbs. pressure to the in.	50 lbs. pressure to the in.	60 lbs. pressure to the in.	70 lbs. pressure to the in.
	23.04 feet head.	46.08 feet head.	69.12 feet head.	92.16 feet head.	116.20 feet head.	138.24 feet head.	161.28 feet head.
	Gal's per minute.	Gal's per minute.	Gal's per minute.	Gal's per minute.	Gal's per minute.	Gal's per minute.	Gal's per minute.
$\frac{1}{2}$ INCH.	5	7	9	11	13	15	19
$\frac{3}{8}$ INCH.	10	15	18	21	25	27	30
$\frac{1}{4}$ INCH.	22	29	37	43	49	55	60
1 $\frac{1}{4}$ INCH.	54	74	91	105	118	131	155

The gallon here used is the wine gallon of 231 cubic inches or  $7\frac{48}{100}$  gallons in one cubic foot.

The size of the Meters, excepting the first, has been based upon the amount of water which will be delivered by an ordinary service pipe of the same size as the Meter, as usually arranged in use. That is to say, the  $\frac{3}{8}$  in. Meter is capable of measuring all the water that would pass through an ordinary  $\frac{3}{8}$  in. service. Practically, however, when the  $\frac{3}{8}$  Meter is placed in a line of  $\frac{3}{8}$  in. service pipe, the delivery will be obstructed just the amount of power required to run the Meter and the friction of the water passing the ports in it. And this we claim to be as small as that in any Piston Meter heretofore used.

These Meters were exhibited at the Mass. Charitable Mechanics Fair

at their eleventh exhibition, held in Boston in September last, and the committee to whom they were submitted, deemed it worthy the award of a silver medal.

The sizes now offered to the public will be furnished at the manufactory in Worcester, at the following prices :

	Iron Bodies.								Brass Bodies.	
$\frac{1}{2}$ inch,	-	-	-	-	\$20.00	-	-	-	-	\$25.00.
$\frac{5}{8}$ "	-	-	-	-	28.00	-	-	-	-	36.00.
$\frac{3}{4}$ "	-	-	-	-	40.00	-	-	-	-	50.00.
$1\frac{1}{4}$ "	-	-	-	-	75.00					

The  $\frac{1}{2}$  inch Meter has been specially designed to meet the demand for a Meter for dwelling houses, ordinary eating houses, small stables, or any place where from one to two thousand gallons of water are consumed in ten hours.

All orders delivered on the cars or to express in the city of Worcester. Boxing extra.

Discounts will be made from these rates on all orders over 20 Meters at one time, in proportion to the number ordered.

All Meters sent out guaranteed to do their work satisfactorily.

Parties visiting New York can see and examine it by calling upon **McREE SWIFT, Engineer and Superintendent of the Patent Water and Gas Pipe Co., office, 91 Liberty Street.**



# FITTS'

## PATENT GOVERNOR AND STOP VALVES.

Fig. 2

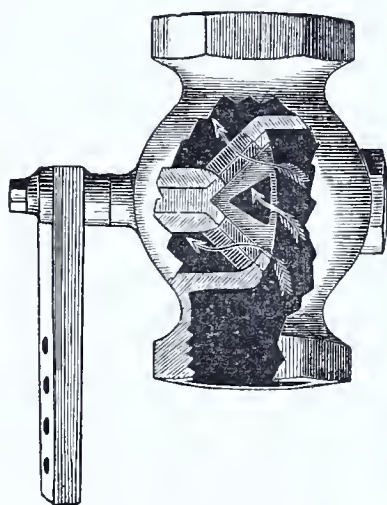


Fig. 1.

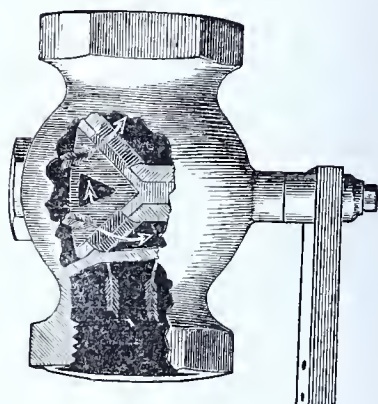
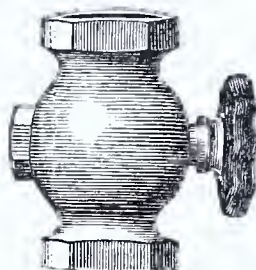


Fig. 3.



Figures 1 and 2 represent the Governor and Chronometer Valve, and Fig. 3 the stop or float valves.

These valves are all made upon the same principle, with a varying arrangement adapting them to the character of service required. The valve and valve seat are turned on an angle of 45 degrees with the axis of the stem of the valve, and are ground to joint when finished. By this form and construction, the joint is not affected by the expansion and contraction of the metal, rendering them as tight when subjected to steam pressure as when cold. The port through the valve being at



right angles to its bearing and closing surface, protects them from the ruinous effects of wire drawing in steam or water so detrimental to valves of other constructions. This form of valve seat has a further advantage of requiring no packing around its stem.

These valves are, therefore, less troublesome, more durable, and better adapted to the purposes which they are designed to serve, than any other kind in use.

Fig. 1 represents the CHRONOMETER GOVERNOR VALVE. The ports in this valve are so arranged as to bring the pressure of steam on both sides of it, thereby relieving it of all friction in moving on its seat. And as no packing around the stem or elsewhere is necessary, it is superior for this purpose to any other ever before offered to the public.

Fig. 2 is designed for a REGULATOR VALVE, for regulating the feed water for steam boilers, or for any other regulating purpose in connection with an expansion pipe, diaphragm or float. Parties ordering this valve, should state for which of the above purposes it is designed to be used. Particular attention is called to this valve on account of its great value as used with a float.

Fig. 3 is a STOP VALVE, and is adapted to any purpose for which such are required, either for steam, water, gas or air. It has been used in various parts of the country, for the last six years, and has never failed to give entire satisfaction, more especially where a *high pressure of steam* is used.

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## P R I C E   L I S T .

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### I R O N   B O D I E S .

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#### C H R O N O M E T E R   G O V E R N O R   V A L V E .

$\frac{3}{4}$ inch,	-	-	-	-	\$5.50	$2\frac{1}{2}$ inch,	-	-	-	-	\$25.00
1   "	-	-	-	-	8.00	3   "	-	-	-	-	35.00
$1\frac{1}{4}$ "	-	-	-	-	11.00	4   "	-	-	-	-	58.00
$1\frac{1}{2}$ "	-	-	-	-	15.00	6   "	-	-	-	-	95.00
2   "	-	-	-	-	20.00	All above 5 inches \$20 per inch.					

#### S T O P   V A L V E .

$\frac{1}{2}$ inch,	-	-	-	-	\$2.00	$2\frac{1}{2}$ inch,	-	-	-	-	\$15.00
$\frac{3}{4}$ "	-	-	-	-	3.00	3   "	-	-	-	-	20.00
1   "	-	-	-	-	4.00	4   "	-	-	-	-	32.00
$1\frac{1}{4}$ "	-	-	-	-	5.00	5   "	-	-	-	-	45.00
$1\frac{1}{2}$ "	-	-	-	-	7.50	All above 5 inches \$10 per inch.					
2   "	-	-	-	-	11.00						

# STEAM PRESSURE REGULATORS.

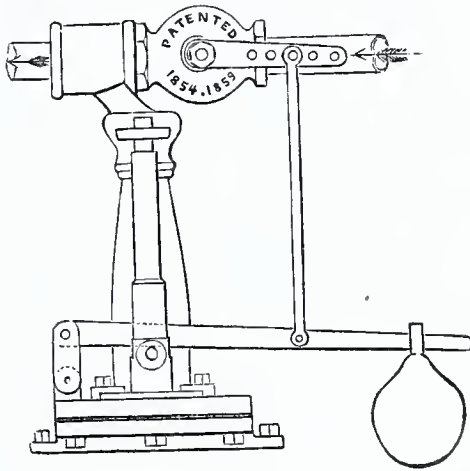
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These machines are for reducing the pressure of the steam used in Dressing Rooms, Dye Houses, Bleacheries, and on Paper Machines, Heating Coils, &c., to any desired point below the pressure of the steam in the generating boiler, and also serve, when once adjusted, the further desirable and more important purpose of sustaining that pressure at a uniform point. As now arranged there is a steam gauge attached to each regulator, to enable the operator to know when the weights upon the balance lever are in the proper position, and sufficiently heavy to maintain constantly the desired pressure. When well adjusted their operation is such that whatever may be the pressure in the boiler, a single pound pressure per square inch may be constantly maintained in a coil of pipe beyond the machine.

It has been in use eight years since its first introduction. They have been applied among many others upon the following manufactories, to wit:

Mr. Horace R. Barker, steam and gas fitter,	Lowell,	Mass.
Lowell Manufacturing Co.,	"	"
Lowell Bleachery,	"	"
Messrs. Braman, Perham & Co.,	Boston,	"
" Chapin & Downes,	Providence,	R. I.
" Fales, Jenks & Son,	Central Falls,	"
Mr. George K. Paul,	Boston,	Mass.
Messrs. J. W. Allen & Co.,	Fitchburg,	"
Mr. John Severance,	Worcester,	"
Messrs. Rice, Barton & Co.,	"	"
Mr. D. Southwick,	Troy,	N. Y.
Mr. Peter Adams,	New York,	"
Carson Paper Co.,	Newburgh,	"
Glen's Falls Paper Co.,	Glen's Falls,	"
Allen Brothers Paper Co.,	Sandy Hill,	"
Benthusen Paper Co.,	Cohoes,	"
Providence Steam and Gas Pipe Co.,	Providence,	R. I.
Clinton Manufacturing Co.,	Woonsocket,	"
Mr. A. B. Prentiss,	Philadelphia,	Penn.
Mr. Thomas Rice,	"	"
Connecticut and Passumpsic Railroad Co.		
W. H. Geist,	Lancaster,	"
The Government Paper Works,	Washington,	D. C.
Holyoke Paper Co.,	Holyoke,	Mass.
Whiting Paper Co.,	"	"
Bartlett & Cutting, paper,	Dalton,	"
The Carew Paper Co.,	So. Hadley,	"
Hampshire Paper Co.,	" "	"
Willimantic Linen Co.,	Willimantic,	Conn

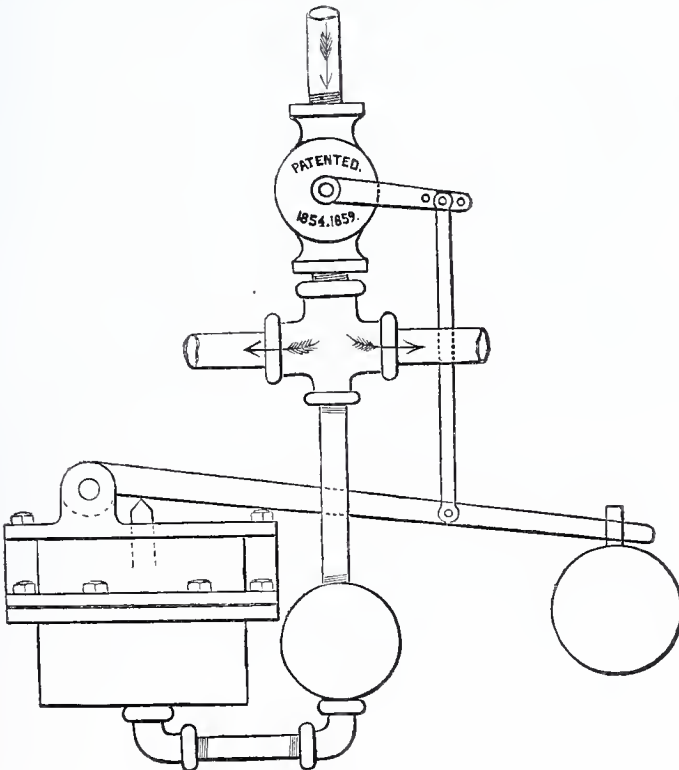
The following cuts represent the different arrangement for two sizes.



*Fig. 1.*

Fig. 1 represents the form used for pipe from  $\frac{1}{2}$  inch to 2 inches in diameter, and Fig. 2 the form from  $2\frac{1}{2}$  inches upwards.

Observe Stamp mark inlet on this end of the Valve, which should in all cases be placed next the steam boiler.



*Fig. 2.*

**PRICE LIST.***Fig. 1.*

$\frac{3}{4}$ inch,	-	-	-	-	\$35.00	$1\frac{1}{2}$ inch,	-	-	-	-	\$75.00
1 " "	-	-	-	-	45.00	2 " "	-	-	-	-	85.00
$1\frac{1}{4}$ " "	-	-	-	-	60.00						

*Fig. 2.*

$2\frac{1}{2}$ inch,	-	-	-	-	\$100.00	4 inch,	-	-	-	-	\$150.00
3 " "	-	-	-	-	125.00						

# FITTS' CELEBRATED STEAM GONG.



For a fire alarm this cannot be excelled except by the costly and intricate electrical fire alarm telegraph. For this purpose it has been adopted by many of the New England cities. It is well adapted to Steamboats for Fog Signals and the like, as well as to large manufacturing establishments to designate the hours of labor.

Its construction is novel and peculiar, entirely unlike the ordinary steam whistle. It has two bells instead of one, as in the steam whistle. These bells are so adjusted and tuned as to produce a musical fifth cord, or with the addition of a third bell a fifth and eighth. This entirely obviates the harsh sound of the whistle, and by following the law of atmospheric harmonic vibration while their tones are soft and pleasant near by, their power of sound is immensely increased. The different sizes are toned to different notes of the musical scale, and by various combination may be varied in pitch to a limited extent. They have been heard thirty miles, thus showing their vast powers of sound. It can be applied to any common boiler, as the quantity of steam required to sound it is trifling.

They have been used by the following parties, as well as by many others :

Manchester Locomotive Works,	.	.	.	.	Manchester, N. H.
Nashua Iron Co.,	.	.	.	.	Nashua, "
Kilburn & Gates,	.	.	.	.	Burlington, Vt.
Tecumseh Mills,	.	.	.	.	Fall River, Mass.
Springfield Republican Office,	.	.	.	.	Springfield, "
Merrick Thread Co.,	.	.	.	.	Holyoke, "
Washburn Iron Works,	.	.	.	.	Worcester, "
Clinton Wire Cloth Manufacturing Co.,	.	.	.	.	Clinton, "
Chapin, Downes & Co.,	.	.	.	.	Providence, R. I.
M. Cook,	.	.	.	.	Woonsocket, "
Meriden Britannia Works,	.	.	.	.	Meriden, Conn.
Willimantic Linen Co.,	.	.	.	.	Willimantic, "
Washington Iron Works,	.	.	.	.	Newburg, N. Y.
New Brunswick Hose Co.,	.	.	.	.	N. Brunswick, N.J.
Key Stone Knitting Co.,	.	.	.	.	Philadelphia, Pa.
Kelley, Howell & Ludwig,	.	.	.	.	" "
Chicago and Alton Railroad Co.	.	.	.	.	

## DIRECTIONS FOR CONNECTING TO THE BOILER.

1. Use a three inch pipe if the steam be less than 75 lbs. to the inch, if above that, two and one-half pipe will answer.
2. Connect to the main pipe of the boiler, or to the boiler itself, in such a way that the water caused by the condensing of steam will run back in the boiler.
3. Carry your pipe to the top of the buildings, place the Gong upon it, with the Valve as near to the Gong in all cases as practicable.

## PRICE.

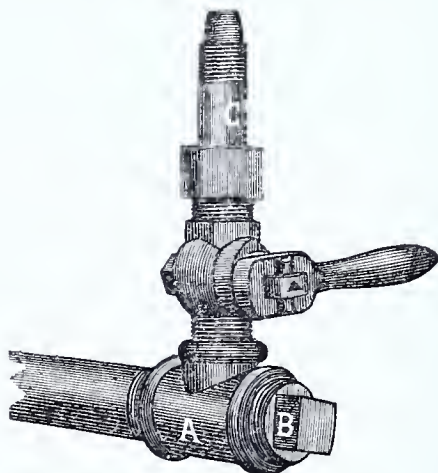
5 inch, including Valve,	.	.	.	.	.	.	\$55.00
8 " " " "	.	.	.	.	.	.	75.00
12 " " " "	.	.	.	.	.	.	115.00
12 " 3 tones harmonized,	.	.	.	.	.	.	150.00

## SERVICE PIPE.

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The attention of Water Companies is called to service pipe made of wrought iron gas pipe lined with cement, which seems to possess many advantages over the ordinary lead pipes.

One inch gas pipe can be lined readily, leaving a bore  $\frac{3}{4}$  inch in diameter, and  $1\frac{1}{4}$  inch lined, one inch bore. Upon the Worcester Water Works during the last three and a half years about 70,000 feet have been laid. It is put together with the ordinary screw couplings in the usual manner of laying steam or gas pipes. The coupling is lined by means of an India rubber cone after the joints are coupled together, thus completely protecting the inside from oxidation. The attachment to the corporation is made with about one foot of lead pipe.



*Fig. 3.*

The waste stops are coupled to it with composition **T**'s, as shown by Fig. 3, by which A represents the composition **T**, B the plug, and C the nipple to which the plumber attaches the supply. The nipple C is made with the usual taper end for the attachment of lead pipe by soldering. Below the taper end this nipple is furnished with a thread for the attachment of galvanized iron pipe. This arrangement of the waste stop is preferred because the removal of the plug B may be effected without any derangement to the apparatus, and by this means any obstructions in the service under the sidewalk or in the street may be very readily removed. By taking care to lay the service in a straight line from the supply main to the inside of the basement they may be readily thawed out when frozen by working a hot water pipe through the open end of



this T. In the severe winter of 1868 one service pipe 90 feet in length was thawed out in this manner upon the Worcester Water Works.

The constant cutting of these pipes for the purpose of making the service of any desired length, has proved the certainty with which it can be lined, and the tenacity of the lining to keep its place when hardened.

This kind of service pipe has the following advantages: Cheapness, durability, freedom from any poisonous influence upon the water, and almost entire exemption from any liability to breakage, or other injury occasioned by the constant excavations for drains, sewers, &c., being made in city and village streets.

The cost of lining is merely nominal, being from 1 to 2 cents per foot. The pipe will vary in first cost in proportion to the facilities for procuring it and the amount ordered.

This service thus far laid upon the Worcester Water Works has not been covered with cement upon the outside in the trenches when laid, it being put in, in the same manner as ordinary gas pipe. But it is recommended to all Companies adopting it, to cover it on the outside,—thus ensuring its increased permanency and durability. It has been used upon the Water Works at New Bedford, where it has been covered upon the outside as laid. Also upon the Water Works at Keene, N. H., Canton, Ohio, and Hartford and Norwich, Conn.

Water Companies or Plumbers, desirous of introducing this kind of service pipe, will be furnished with the appropriate apparatus and materials, at the following rates.

	$\frac{1}{2}$ Inch.	$\frac{3}{8}$ Inch.	$\frac{3}{4}$ Inch.	1 Inch.	$1\frac{1}{2}$ Inch.
Drain Stops, . . . . .	1.75	2.20	3.20		
Sidewalk Stops for iron pipes, .	1.40	1.70	2.70		
Sidewalk Stops, solder ends, .	1.30	1.60	2.60		
Solder Nipples for iron pipe, .			.50	70	
Brass Tees, . . . . .				.65	.80
Hose Couplings, . . . . .	60	.75	.80	1.10	
Press for filling Pipes, with two sets Cones, . . . . .	65.00				

# IMPROVED HYDRANT WASTE.

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This is so arranged that on being applied to any hydrant having an open box or tube running to it from the surface, in case of being obstructed, the working valve may be readily detached from its body, by a hook or tongs, and brought to the surface and cleaned and repaired, and then replaced without disturbing any portion of the hydrant or any fixtures around it. It may be applied to any hydrant now in use where the wastes have become useless, without taking the hydrant from its setting.

PRICE, . . . . . \$2.00 each.

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Address

JOHN C. OTIS, *Treasurer.*

Worcester, Mass., Jan., 1870.

[P. O. Box, 849.]